Proposed Amendments to the Airborne Toxic Control Measure (ATCM) for Chromium Plating and Chromic Acid Anodizing Facilities

Public Workshops August 21st, 2006, Sacramento, CA & August 23rd, 2006, Diamond Bar, CA

Outline

- Status of Proposal
- Background
- Revised regulatory proposal
- Other key comments
- Findings leading to the proposal
- Proposed regulatory language changes since June Public Workshop
- Impacts and benefits of the proposed amendments
 - Comparison to adopting provisions of SCAQMD Rule 1469 statewide
- Contact Information

Status of Proposal

- Staff Report released on August 11, 2006
- Board Hearing scheduled for September 28th, 2006
 - □ 45-Day Public Comment Period

3

BACKGROUND

Hexavalent Chromium Identification and Control

- ARB identified hexavalent chromium as a Toxic Air Contaminant (1986)
 - Extremely potent human carcinogen with no safe threshold
 - □ Unit Risk factor 0.15 (µg/m³)-1
 - □ Cancer Potency Factor 5.1 X 10⁺² (mg/kg-day)⁻¹

5

Inhalation Cancer Potency Factors for Common Carcinogens and Their Relative Potency to Hexavalent Chromium

Compound (in descending order)	Cancer Potency Factor (mg/kg-day) ⁻¹	Relative Potency to Hexavalent Chromium
Dioxin	1.3 X 10 ⁺⁵	250
Hexavalent Chromium	5.1 X 10 ⁺²	1
Cadmium	1.5 X 10 ⁺¹	.029
Arsenic (inorganic)	1.2 X 10 ⁺¹	.024
Diesel Exhaust	1.1 X 10	.0022
Nickel	9.1 X 10 ⁻¹	.0018
Benzene	1.0 X 10 ⁻¹	.0002
Ethylene Dichloride	7.2 X 10 ⁻²	.00014
Lead	4.2 X 10 ⁻²	.000082
Formaldehyde	2.1 X 10 ⁻²	.000041
Perchloroethylene	2.1 X 10 ⁻²	.000041
Chloroform	1.9 X 10 ⁻²	.000037
Acetaldehyde	1.0 X 10 ⁻²	.000020
Trichloroethylene	7.0 X 10 ⁻³	.000014
Methylene Chloride	3.5 X 10 ⁻²	.000069

Hexavalent Chromium Identification and Control

- Control Measure for Chromium Plating and Chromic Acid Anodizing facilities
 - □ Adopted 1988
 - □ Amended 1998
 - Emissions for some facilities reduced by over 99%

7

Industry Survey Results

- 228 active facilities, 222 of these are hexavalent chromium facilities
 - 55% decorative, 25% hard, 20% anodizing
- 75% are located in SCAQMD
- Annual throughput in Ampere-Hours
 - □ 48 facilities (20%) with < 20,000
 - □ 60 facilities (30%) with >20,000 <200,000
 - □ 112 facilities (50%) with >200,000
 - No throughput data for 2 facilities
- Total statewide emissions are 4.0 pounds per year

Near Source Risk with Current Controls (2005 Baseline)*

Estimated Cancer Risk per million**	Number of Facilities
<u><</u> 1	90
>1 <u><</u> 10	67
>10 <u><</u> 100	57
>100	6

^{*} Reflects implementation of Rule 1469 in SCAQMD

9

August 11, 2006 Revised Regulatory Proposal

^{**}Based on computer modeling, 2003 survey data, lifetime exposure of 70 years

Revised Regulatory Proposal Since June Public Workshops

- Presented three methods to reduce hexavalent chromium emissions
 - Risk and proximity to sensitive receptors
 - Phase-out of hexavalent chromium for decorative plating facilities (require use of trivalent chromium)
 - Require BACT for all facilities
- Industry asked us to evaluate adoption of the provisions of SCAQMD Rule 1469 Statewide

1

Risk and Proximity to Sensitive Receptors

- Established requirements based on risk and proximity to sensitive receptors
 - More stringent requirements if within 100 meters of a sensitive receptor
 - 5 per million exposed people was basis for throughput thresholds
- Received comments on complexity, how to measure distance, and how risk levels were determined
- Based on comments, not recommending this approach

Phase-out of Hexavalent Chromium

- Investigated feasibility of requiring use of trivalent chromium process for all decorative chromium applications
 - Comments indicate not yet suitable for all applications, especially automotive end-uses
- Based on comments, not recommending this approach
 - Not yet technologically feasible

13

BACT for all Facilities

- Redefine BACT and require for all facilities
 - All facilities would be required to install HEPA filters or meet emission limit of 0.0015 mg/amp-hr after an add-on air pollution control device
 - Phase-in based on cancer risk of 10/million exposed people
- Comments that very small facilities with low estimated cancer risk should be allowed to meet an alternative higher emission limit

BACT for all Facilities (con't)

- Based on comments on all three proposals, staff is basing the proposal on application of BACT
 - Modification from June proposal would be to redefine BACT for very small facilities
 - BACT is determined based on throughput in consideration of risk and cost

15

Other Key Comments

Modeling and Health Risk Assessment

- Several comments related to modeling and the health risk assessment which was used as the basis for the proposal
 - Modeling consistent with established ARB methodologies
 - Health risk assessment consistent with OEHHA guidelines
 - Health risk assessment was conducted in a manner which is health protective to account for all reasonably foreseeable scenarios

17

Findings Leading to the Proposal

Basis for Requiring Further Control of Hexavalent Chromium Emissions

- Potent human carcinogen
- Emission factor for decorative plating facilities was underestimated in existing ATCM
 - Determined emissions are maximally reduced only if certain chemical fume suppressants are used under specific conditions
 - Testing confirmed results of SCAQMD certification testing
- Ambient hexavalent chromium concentrations are low and declining
 - 30% are non-detects in the ambient air network

19

Basis for Requiring Further Control of Hexavalent Chromium Emissions (con't)

- Near source exposures may be unacceptable
 - SCAQMD monitoring
 - 6 out of 10 facilities with risk exceeding 20/million exposed people (range was 20 to 450 per million exposed people)
 - Modeling analyses estimate unacceptable exposures
 - 26% of facilities' cancer risk exceeds 10/million exposed people
 - Barrio-Logan data support these findings
- 43% of facilities within 100 meters of a sensitive receptor
 - Modeling analyses indicate receptors within 100 meters are at greatest risk

Basis for Requiring Further Control of Hexavalent Chromium Emissions (con't)

- Fugitive emissions play role in overall facility impact
 - SDCAPCD dust data analysis
 - Indoor monitoring during testing program
 - Barrio-Logan data support findings
- Low-income and ethnically diverse communities may be disproportionately impacted
- Reliable controls available and in use
 - 30% of facilities currently using HEPA filters to reduce emissions
 - 38% of facilities currently have emission rates at 0.0015 mg/amp-hr or less

2

Best Available Control Technology

- Staff evaluated Best Available Control Technology
- For small facilities (< 20,000 amp-hrs), BACT is use of specific chemical fume suppressants</p>
 - Capable of reducing emissions to 0.01 mg/amp-hr
- For intermediate and large facilities, BACT is use of an add-on air pollution control device(s) with the final capture device being a HEPA filter
 - Reduces emissions to 0.0015 mg/amp-hr or less
 - Other add-on air pollution controls which achieve equivalent emission rate are also considered BACT
 - For intermediate-sized facilities, in consideration of risk and cost, providing flexibility to demonstrate compliance without an add-on air pollution control device

Proposed Regulatory Language Changes Since June Public Workshops

Key Elements of the Proposal

- Provides maximum achievable risk reduction based on BACT
- Reduces near source risk from all existing, modified and new facilities
- Isolates new facilities from sensitive receptors
- Reduces fugitive emissions

Organization

- Proposing to number sections consecutively in order to make the regulation easier to read
- Section 93102 explains the organization of the regulation and clarifies which requirements pertain to a specific facility

25

Section 93102.1--Applicability

- Applies to any owner or operator of a facility
- Applies to 'Facility' rather than 'Tank'
- Proposing to extend the applicability to manufacturers or distributors of chromium plating or chromic acid anodizing kits

Section 93102.3--Definitions

- Proposed modified definitions since June public workshops
 - Air Pollution control technique
 - Annual Permitted Ampere-hour
 - Enclosed storage area
 - Facility
 - Modification
 - Sensitive receptor
- Deleted proposed definition for air sparging

2

Section 93102.4--Emission Limits

- Proposed subsection (a), Existing Hexavalent Chromium Limits
 - Current limits to remain in effect until new requirements become effective
- Proposed subsection (b), New Hexavalent Chromium Limits for Existing Facilities

Section 93102.4--Table of Limits

Tiers of Annual	Sensitive	Emission Limitation	Effective Date
Permitted	Receptor		
Ampere-Hrs	Distance		
Tier 1		Use Chemical Fume	[Six Months after
<u><</u> 20,000	Any	Suppressant as specified	Effective Date]
		in section 93102.8	
Tier 2	<u><</u> 100	0.0015 milligrams/amp-	[Two years after
>20,000 & <200,000	meters	hour	Effective Date]
Tier 3	> 100	0.0015 milligrams/amp-	[Five Years after
>20,000 & <200,000	meters	hour	Effective Date]
Tier 4		0.0015 milligrams/amp-	[Two Years after
>200,000	Any	hour	Effective Date]

29

Section 93102.4(c)--Modified Facilities

Requirements

- Use add on air pollution control device(s)
- Meet 0.0015 mg/amp-hr emission rate measured after add-on controls
- If annual actual annual hexavalent chromium emissions exceed 15 grams per year, conduct a site specific analysis in accordance with the permitting agency's procedures
 - Based on estimated cancer risk of 25 per million people exposed

Section 93102.4(d)--New Facilities

- No person shall operate a new chromium plating or anodizing facility unless all the following criteria are met
 - Facility may not be located in an area zoned residential or mixed use, or within 150 meters of an area so zoned
 - Install HEPA add-on air pollution control device and meet an emission rate of 0.0015 mg/amp-hr
 - Conduct site specific analysis in accordance with the permitting agency's procedures

31

Section 93102.5--Additional Requirements

- Proposed changes based on comments
 - Deleted requirement for all facilities to use specified chemical fume suppressants except for the following:
 - Facilities < 20,000 amp-hrs/year
 - Intermediate facilities with > 20,000 to ≤ 200,000 amphrs demonstrating compliance with the 0.0015 mg/amp-hr limit without add-on air pollution control
 - No prohibition on air sparging

Section 93102.7 and 93102.9

- Proposed changes based on comments
 - Surface tension using a stalagmometer can be measured using the procedure in Appendix 8, or an alternative procedure approved by the permitting agency

33

Section 93102.15--Requirements Relating to Chromium Plating Kits

- Adding new requirements to reduce emissions and exposure from use of these kits by untrained persons
- Kits could not be sold, supplied, offered for sale, or manufactured for sale in California
- This provision does not apply to the owner or operator of a chromium plating and chromic acid anodizing facility performing plating or anodizing at a permitted facility

Other Sections of the Proposed Amendments

- No substantive changes are proposed to sections:
 - □ 93102.2, Exemptions
 - 93102.6, Trivalent Chromium Plating and Enclosed Hexavalent Chromium Plating
 - □ 93102.8, Chemical Fume Suppressants
 - 93102.10 through 93102.14, related to parameter monitoring, inspection and maintenance, recordkeeping, reporting, alternatives

35

Potential Impacts and Benefits of the Proposed Amendments

Emission and Cancer Risk Reduction Benefits

- Achieves maximum hexavalent chromium emission reduction
 - An additional 40 percent of facilities would be reducing emissions by over 99 percent
 - Total emission after the proposal are 1.8 lbs/yr
- Reduces risk for all existing facilities
- Ensures new facilities are isolated from sensitive receptors
- Reduces fugitive hexavalent chromium emissions

37

Almost all Facilities would have Estimated Cancer Risk of ≤ 10/Million Exposed

Number of Facilities by Cancer Risk

	≤1 per million	>1 ≤10 per million	>10 <u><</u> 100 per million	>100 per million
Staff proposal	162	41	17	0
Statewide Baseline*	90	67	57	6

^{*} Reflects implementation of Rule 1469 in the SCAQMD

- •162 facilities (74%) would have estimated cancer risk of less than or equal to one per million exposed people
- •203 facilities (92%) would have estimated cancer risk of less than or equal to ten per million exposed people

Environmental Justice Impact

- Proposal is consistent with ARB's Environmental Justice Policies
- Determined that low-income and ethnically diverse communities are disproportionately impacted by hexavalent chromium emissions
 - These communities would benefit most from adoption of the proposal

39

Alternative to Staff Proposal: Apply Provisions of SCAQMD Rule 1469 Statewide

- Rule 1469 established a risk based rule for hexavalent chromium facilities
 - □ Facilities located within 25 meters of a sensitive receptor or within 100 meters of a school were required to reduce emissions such that residential cancer risk is ≤ 10/million exposed people
 - □ Facilities located greater than 25 meters from a sensitive receptor or greater than 100 meters from a school were required to reduce emissions such that off-site worker cancer risk is ≤ 25/million exposed people

Alternative to Staff Proposal: Apply Provisions of SCAQMD Rule 1469 Statewide

- Staff has evaluated this alternative and determined that BACT is not required for all facilities
- Does not provide maximum feasible reduction and level of protection as the staff's proposal
- Determining level of control based on off-site worker risk scenarios is not protective enough for public exposures

41

Result of Adopting Rule 1469 Statewide

 By requiring BACT for all facilities ARB staff's proposal provides best public health protection

Number of Facilities by Cancer Risk

	≤1 per million	>1 <10 per million	>10 <u><</u> 100 per million	>100 per million
Staff proposal	162	41	17	0
1469 Statewide	98	67	53	2
Baseline	90	67	57	6

Total Cost of Proposal

- Total cost of \$14.2 million
- Capital cost of \$9.6 million
 - Cost estimated based on 89 facilities installing HEPA addon air pollution control device
 - May be overestimated because some facilities may demonstrate compliance without installing add-on air pollution controls
- Ongoing costs of \$3.6 million
- Reporting, source testing, permit renewal, etc. cost of \$1.0 million

4

Estimated Compliance Costs for Individual Facilities

- About 60% of the facilities already in substantial compliance
- Costs in the first year

□ Range: \$450 - \$217,000

□ Average: \$23,000

Subsequent years

□ Range: near zero - \$217,000

■ Average: \$53,000

Profitability Impacts

- Costs for some individual businesses are expected to be significant and may adversely impact their profitability
- Some businesses may secure necessary capital through the loan guarantee program

45

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